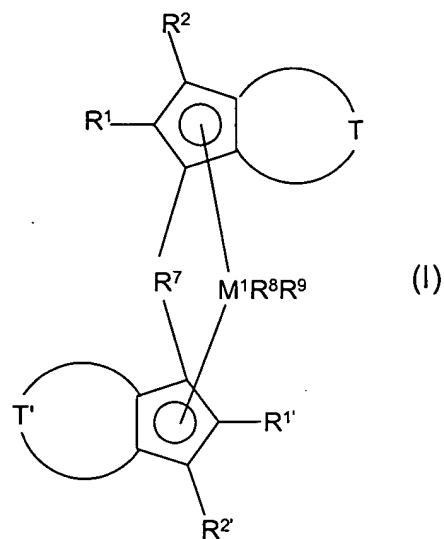




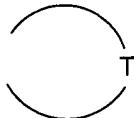
ATTACHMENT A

Claims 1 - 11: (Cancelled)

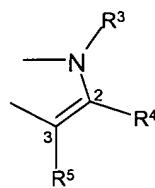
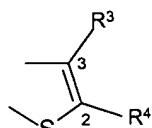
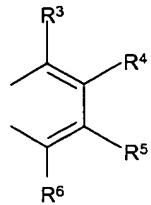
12. (New) A transition metal compound of formula (I)



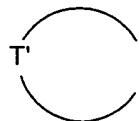
wherein



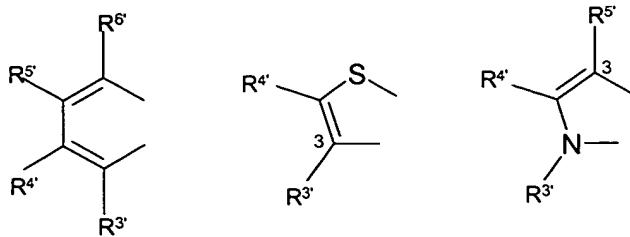
is a divalent group selected from



and



is a divalent group selected from



wherein

M^1 is titanium, zirconium, or hafnium;

R^1, R^2 are identical or different, and are each a C_1-C_{20} group;

$R^{1'}, R^{2'}$ are identical or different, and are identical to or different from R^1 or R^2 , and are each hydrogen or a C_1-C_{20} group;

R^3 is a C_6-C_{18} -aryl group, a C_4-C_{18} -heteroaryl, a fluorinated C_6-C_{20} -aryl or C_7-C_{20} -alkylaryl, wherein the aryl part of any of the preceding groups may bear at least one linear or branched C_1-C_{18} -alkyl, C_1-C_{18} -alkoxy, C_2-C_{10} -alkenyl or C_3-C_{15} -alkylalkenyl groups as substituents, or R^3 together with R^4 forms a monocyclic or polycyclic ring system which may be substituted;

$R^{3'}$ is hydrogen or a C_1-C_{40} group, or $R^{3'}$ together with $R^{4'}$ forms a monocyclic or polycyclic ring system which may be substituted;

$R^4, R^{4'}$ are identical or different, and are each hydrogen or a C_1-C_{20} group;

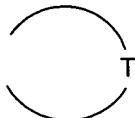
$R^5, R^{5'}, R^6, R^{6'}$ are identical or different, and are each hydrogen or a C_1-C_{20} group;

R^7 is a bridging structural element between the two indenyl radicals of formula (I), and is $M^2R^{10}R^{11}$, wherein M^2 is silicon, germanium, tin or carbon;

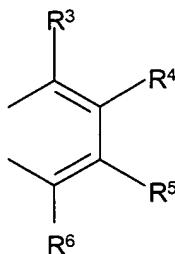
and R^{10} and R^{11} are identical or different, and are each hydrogen or a C_1-C_{20} -hydrocarbon-containing group; and

R^8, R^9 are identical or different, and are each a halogen, a linear or branched C_1-C_{20} -alkyl, or a substituted or unsubstituted phenoxide, or R^8 and R^9 are joined to form a monocyclic or polycyclic ring system which may be substituted.

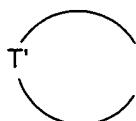
13. (New) The transition metal compound as claimed in claim 12, wherein



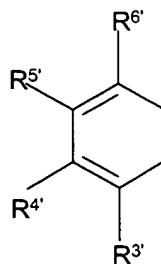
is



and



is



wherein

R^3 is a C_6 - C_{18} -aryl group, a C_4 - C_{18} -heteroaryl, a fluorinated C_6 - C_{20} -aryl or C_7 - C_{20} -alkylaryl, wherein the aryl part of any of the preceding groups may bear at least one linear or branched C_1 - C_{18} -alkyl, C_1 - C_{18} -alkoxy, C_2 - C_{10} -alkenyl or C_3 - C_{15} -alkylalkenyl groups as substituents, or R^3 together with R^4 forms a monocyclic or polycyclic ring system which may be substituted;

R^3' is hydrogen or a C_1 - C_{40} group, or R^3' together with R^4' forms a monocyclic or polycyclic ring system which may be substituted;

R^4, R^4' are identical or different, and are each hydrogen or a C_1 - C_{20} group; and

R^5, R^5', R^6, R^6' are identical or different, and are each hydrogen or a C_1 - C_{20} group.

14. (New) The transition metal compound as claimed in claim 12, wherein

M^1 is zirconium;

R^1, R^2 are identical or different, and are each a C_1 - C_{12} -alkyl group;

R^1', R^2' are identical or different, and are each hydrogen, methyl, ethyl, n-propyl, isopropyl, n-butyl, isobutyl, tert-butyl, cyclopentyl or cyclohexyl;

R^3, R^3' are identical or different, and are each a C_6 - C_{18} -aryl group, or R^3 together with R^4 and/or R^3' together with R^4' may form a monocyclic or

polycyclic ring system which may be substituted, and R³' may be hydrogen;

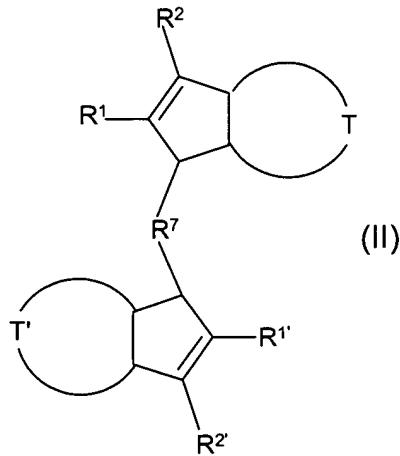
R⁴, R⁴' are identical or different, and are either hydrogen or R⁴ together with R³ and/or R⁴' together with R³' form a monocyclic or polycyclic ring system;

R⁵, R⁵', R⁶, R⁶' are identical or different, and are each hydrogen, a linear or branched C₁-C₁₈-alkyl, C₂-C₁₀-alkenyl or C₃-C₁₅-alkylalkenyl; a C₆-C₂₀-aryl, a C₄-C₁₈-heteroaryl, a C₇-C₂₀-arylalkyl; or a fluorinated C₁-C₁₂-alkyl, C₂-C₁₀-alkenyl, C₆-C₂₀-aryl or C₇-C₂₀-arylalkyl;

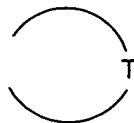
R⁷ is a bridging structural element SiR¹⁰R¹¹, wherein R¹⁰ and R¹¹ are identical or different, and are a C₁-C₂₀-hydrocarbon-containing group; and

R⁸, R⁹ are each chlorine or methyl.

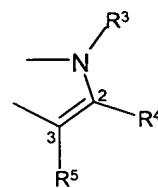
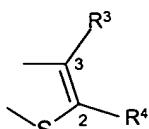
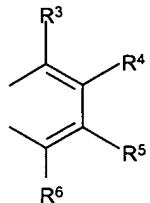
15. (New) A ligand system of formula (II), or its double bond isomers,



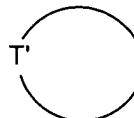
wherein



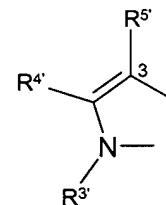
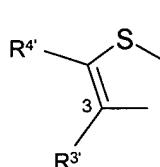
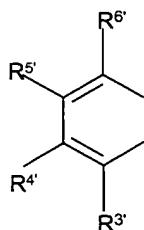
is a divalent group selected from



and



is a divalent group selected from



wherein

R^1, R^2 are identical or different, and are each a C_1-C_{20} group;

$R^{1'}, R^{2'}$ are identical or different, and are identical to or different from R^1 or R^2 , and are each hydrogen or a C_1-C_{20} group;

R^3 is a C_6-C_{18} -aryl group, a C_4-C_{18} -heteroaryl, a fluorinated C_6-C_{20} -aryl or C_7-C_{20} -alkylaryl, wherein the aryl part of any of the preceding groups may bear at least one linear or branched C_1-C_{18} -alkyl, C_1-C_{18} -alkoxy, C_2-C_{10} -alkenyl or C_3-C_{15} -alkylalkenyl groups as substituents, or R^3 together with R^4

forms a monocyclic or polycyclic ring system which may be substituted;

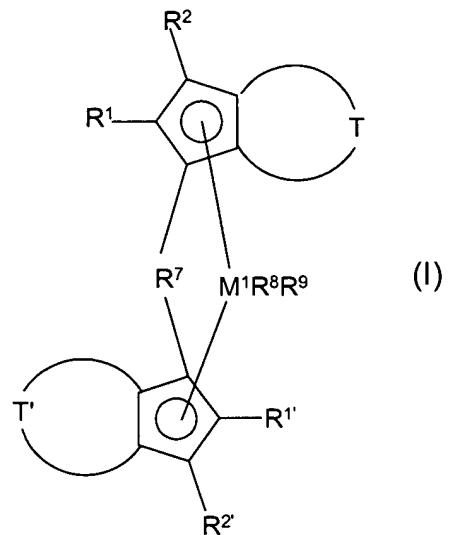
$R^{3'}$ is hydrogen or a C_1-C_{40} group, or $R^{3'}$ together with $R^{4'}$ forms a monocyclic or polycyclic ring system which may be substituted;

$R^4, R^{4'}$ are identical or different, and are each hydrogen or a C_1-C_{20} group;

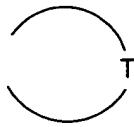
$R^5, R^{5'}, R^6, R^{6'}$ are identical or different, and are each hydrogen or a C_1-C_{20} group; and

R^7 is a bridging structural element between the two indenyl radicals of formula (I), and is $M^2R^{10}R^{11}$, wherein M^2 is silicon, germanium, tin or carbon; and R^{10} and R^{11} are identical or different, and are each hydrogen or a C_1-C_{20} -hydrocarbon-containing group.

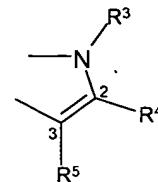
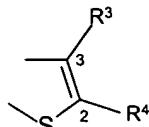
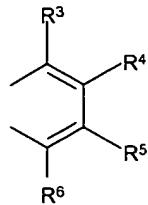
16. (New) A process for preparing a transition metal compound of formula (I)



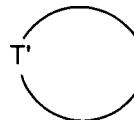
wherein



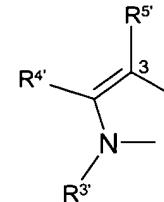
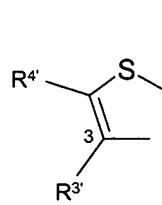
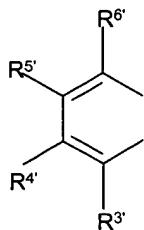
is a divalent group selected from



and



is a divalent group selected from



wherein

M^1 is titanium, zirconium, or hafnium;

R^1, R^2 are identical or different, and are each a C_1-C_{20} group;

R^1', R^2' are identical or different, and are identical to or different from R^1 or R^2 , and are each hydrogen or a C_1-C_{20} group;

R^3 is a C_6-C_{18} -aryl group, a C_4-C_{18} -heteroaryl, a fluorinated C_6-C_{20} -aryl or C_7-C_{20} -alkylaryl, wherein the aryl part of any of the preceding groups may bear at least one linear or branched C_1-C_{18} -alkyl, C_1-C_{18} -alkoxy, C_2-C_{10} -alkenyl or C_3-C_{15} -alkylalkenyl

groups as substituents, or R^3 together with R^4 forms a monocyclic or polycyclic ring system which may be substituted;

$R^{3'}$ is hydrogen or a C_1 - C_{40} group, or $R^{3'}$ together with $R^{4'}$ forms a monocyclic or polycyclic ring system which may be substituted;

$R^4, R^{4'}$ are identical or different, and are each hydrogen or a C_1 - C_{20} group;

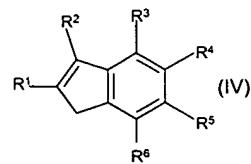
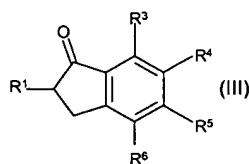
$R^5, R^{5'}, R^6, R^{6'}$ are identical or different, and are each hydrogen or a C_1 - C_{20} group;

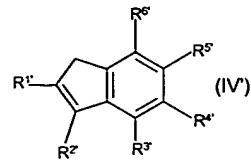
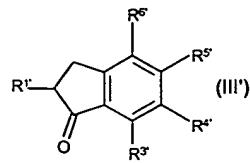
R^7 is a bridging structural element between the two indenyl radicals of formula (I), and is $M^2R^{10}R^{11}$, wherein M^2 is silicon, germanium, tin or carbon; and R^{10} and R^{11} are identical or different, and are each hydrogen or a C_1 - C_{20} -hydrocarbon-containing group; and

R^8, R^9 are identical or different, and are each a halogen, a linear or branched C_1 - C_{20} -alkyl, or a substituted or unsubstituted phenoxide, or R^8 and R^9 are joined to form a monocyclic or polycyclic ring system which may be substituted;

the process comprising:

- reacting a 1-indanone of formula (III) or (III') with an organometallic compound ($M^3R^2{}_mHal_n$) or ($M^3R^{2'}{}_mHal_n$) with subsequent elimination to form a substituted indene of formula (IV) or (IV'),





wherein

R^1, R^2 are identical or different, and are each a C_1-C_{20} group;

$R^{1'}, R^{2'}$ are identical or different, and are identical to or different from R^1 or R^2 , and are each hydrogen or a C_1-C_{20} group;

R^3 is a C_6-C_{18} -aryl group, a C_4-C_{18} -heteroaryl, a fluorinated C_6-C_{20} -aryl or C_7-C_{20} -alkylaryl, wherein the aryl part of any of the preceding groups may bear at least one linear or branched C_1-C_{18} -alkyl, C_1-C_{18} -alkoxy, C_2-C_{10} -alkenyl or C_3-C_{15} -alkylalkenyl groups as substituents, or R^3 together with R^4 forms a monocyclic or polycyclic ring system which may be substituted;

$R^{3'}$ is hydrogen or a C_1-C_{40} group, or $R^{3'}$ together with $R^{4'}$ forms a monocyclic or polycyclic ring system which may be substituted;

$R^4, R^{4'}$ are identical or different, and are each hydrogen or a C_1-C_{20} group;

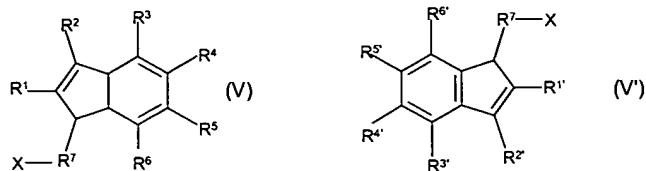
$R^5, R^{5'}, R^6, R^{6'}$ are identical or different, and are each hydrogen or a C_1-C_{20} group;

M^3 is an alkali metal, an alkaline earth metal, aluminum, or titanium;

Hal is a halogen; and

m is an integer equal to or greater than 1, and $m+n$ corresponds to a valence of M^3 ;

- deprotonating the substituted indene of formula (IV) or (IV') to form a deprotonated substituted indene, and subsequently reacting the deprotonated substituted indene with at least one compound (R^7X_2) to form at least one compound of formula (V), (V'), the double bond isomers of formula (V) and/or (V'), and mixtures thereof,

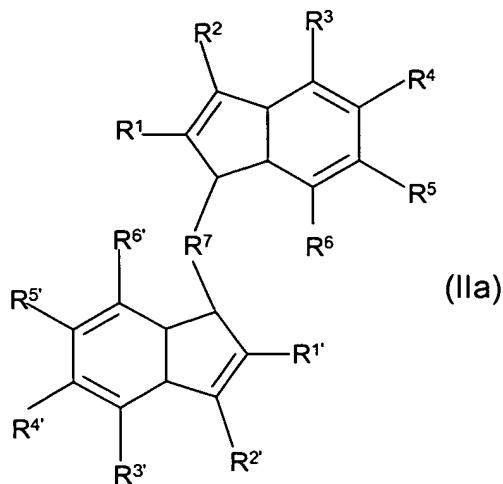


wherein

X is Cl, Br, I or O-tosyl; and

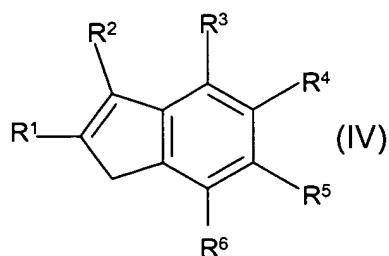
R^7 is a bridging structural element between the two indenyl radicals of formula (I), and is $M^2R^{10}R^{11}$, wherein M^2 is silicon, germanium, tin or carbon; and R^{10} and R^{11} are identical or different, and are each hydrogen or a C_1-C_{20} -hydrocarbon-containing group;

- reacting at least one compound of formula (V), (V'), the double bond isomers of formula (V) and/or (V'), and mixtures thereof, with a second deprotonated indene obtained by deprotonating at least one compound of formula (IV) or (IV') to form a ligand system of formula (IIa), or its double bond isomers; and



- deprotonating the ligand system of formula (IIa), or its double bond isomers, to form a deprotonated ligand system, and reacting the deprotonated ligand system with at least one compound ($X_2M^1R^8R^9$) to obtain a transition metal compound of formula (I), wherein X is Cl, Br, I or O-tosyl; and M^1 is titanium, zirconium, or hafnium; R^8 and R^9 are identical or different, and are each a halogen, a linear or branched $C_{1-C_{20}}$ -alkyl, or a substituted or unsubstituted phenoxide, or R^8 and R^9 are joined to form a monocyclic or polycyclic ring system which may be substituted.

17. (New) An indene of formula (IV), or its double bond isomer,



wherein

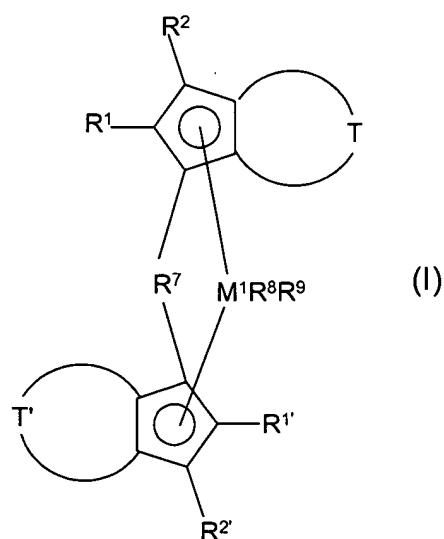
R^1 , R^2 are identical or different, and are each a C_1 - C_{20} group;

R^3 is a C_6 - C_{18} -aryl group, a C_4 - C_{18} -heteroaryl, a fluorinated C_6 - C_{20} -aryl or C_7 - C_{20} -alkylaryl, wherein the aryl part of any of the preceding groups may bear at least one linear or branched C_1 - C_{18} -alkyl, C_1 - C_{18} -alkoxy, C_2 - C_{10} -alkenyl or C_3 - C_{15} -alkylalkenyl groups as substitutents;

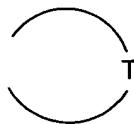
R^4 is hydrogen or a C_1 - C_{20} group; and

R^5 , R^6 are identical or different, and are each hydrogen or a C_1 - C_{20} group.

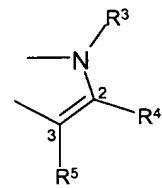
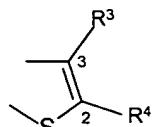
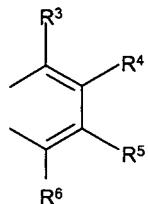
18. (New) A catalyst system comprising at least one cocatalyst and/or support, and at least one transition metal compound of formula (I)



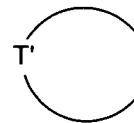
wherein



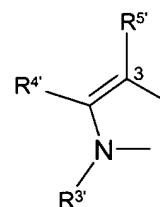
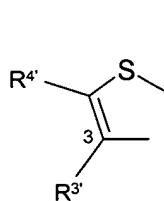
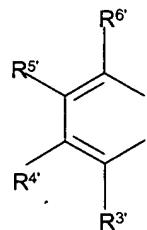
is a divalent group selected from



and



is a divalent group selected from



wherein

M^1 is titanium, zirconium, or hafnium;

R^1, R^2 are identical or different, and are each a C_1-C_{20} group;

R^1', R^2' are identical or different, and are identical to or different from R^1 or R^2 , and are each hydrogen or a C_1-C_{20} group;

R^3 is a C_6-C_{18} -aryl group, a C_4-C_{18} -heteroaryl, a fluorinated C_6-C_{20} -aryl or C_7-C_{20} -alkylaryl, wherein the aryl part of any of the preceding groups may

bear at least one linear or branched C₁-C₁₈-alkyl, C₁-C₁₈-alkoxy, C₂-C₁₀-alkenyl or C₃-C₁₅-alkylalkenyl groups as substituents, or R³ together with R⁴ forms a monocyclic or polycyclic ring system which may be substituted;

R^{3'} is hydrogen or a C₁-C₄₀ group, or R^{3'} together with R^{4'} forms a monocyclic or polycyclic ring system which may be substituted;

R⁴,R^{4'} are identical or different, and are each hydrogen or a C₁-C₂₀ group;

R⁵,R^{5'},R⁶,R^{6'} are identical or different, and are each hydrogen or a C₁-C₂₀ group;

R⁷ is a bridging structural element between the two indenyl radicals of formula (I), and is M²R¹⁰R¹¹, wherein M² is silicon, germanium, tin or carbon; and R¹⁰ and R¹¹ are identical or different, and are each hydrogen or a C₁-C₂₀-hydrocarbon-containing group; and

R⁸,R⁹ are identical or different, and are each a halogen, a linear or branched C₁-C₂₀-alkyl, or a substituted or unsubstituted phenoxide, or R⁸ and R⁹ are joined to form a monocyclic or polycyclic ring system which may be substituted.

19. (New) A process for preparing a polyolefin by polymerizing at least one olefin in presence of the catalyst system as claimed in claim 18.

20. (New) The process as claimed in claim 19, wherein the polyolefin is an ethylene-propylene copolymer.

21. (New) A process for preparing a polyolefin by polymerizing at least one olefin in presence of at least one transition metal compound of formula (I) as claimed in claim 12.